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A Recent Trend in Unintentional Poisoning Deaths in Kentucky

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Background

From an injury prevention perspective, poisoning refers to an acute exposure to any of a wide range of substances including medications, illicit drugs, alcohol, carbon monoxide, pesticides, and others, in an amount sufficient to cause physical harm. Poisoning includes both unintentional and intentional exposures to such agents.

This article describes a recent increase in unintentional poisoning deaths in Kentucky residents. Similar results for Kentucky were reported by Singleton, Qin and Williams in the Centers for Disease Control and Prevention's (CDC) *Morbidity and Mortality Weekly Review* (CDC 2004). This summary grew from the work that was published there. A more in-depth descriptive analysis of the Kentucky-specific data summarized in that article is available at www.kiprc.uky.edu/projects/State_inj_surveillance (Singleton 2003). The specific numbers of deaths reported here differ slightly from those reports because (1) these data were derived from CDC's Web-based Injury Statistics Query and Reporting System (WISQARS) (CDC 2003), whereas the others were based on computerized death certificate files obtained directly from the Kentucky Office of Vital Statistics, and (2) this report considers Kentucky residents only. The trends and conclusions, however, are the same.

The International Classification of Diseases (ICD-9

Table 1. ICD Codes for Poisoning

Manner of Injury	ICD-9 (1990-1998)	ICD-10 (1999-2001)
Unintentional	E 850-E 869	V40-V49
Suicide	E 950-E 952	X60-X69
Homicide	E 962, E972	X85-X90, Y 35.2, U01 (.6,. 7)
Undetermined	E 980-E 982	Y10-Y19

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and ICD-10) codes used to define poisoning in the WISQARS system are shown in Table 1 (WHO 1977, WHO 1992).

All age-adjusted rates in this article were adjusted to the year 2000 standard population.

For the analysis of substances identified in poisoning deaths, the multiple-cause-of-death files were utilized from the National Center for Health Statistics (NCHS) for 1999-2001. These files are based upon the official Kentucky death certificates, but contain up to 20 supplemental causes of death, in addition to the underlying cause of death which identifies a fatality as poisoning-related. (Typically only the underlying cause of death is recorded on the state's computerized death certificate files.) The WISQARS system is built upon the multiple-cause-of-death files, so it is appropriate to combine the two sources for this analysis. A secondary purpose of this article is to demonstrate the usefulness of the multiple-cause-of-death files as a poisoning surveillance tool. One key limitation of this source is its lack of timeliness; as of this writing the most recent year for which data were available was 2001.

(Continued on Page 2)

Poisoning deaths, Kentucky residents, 1990-2001

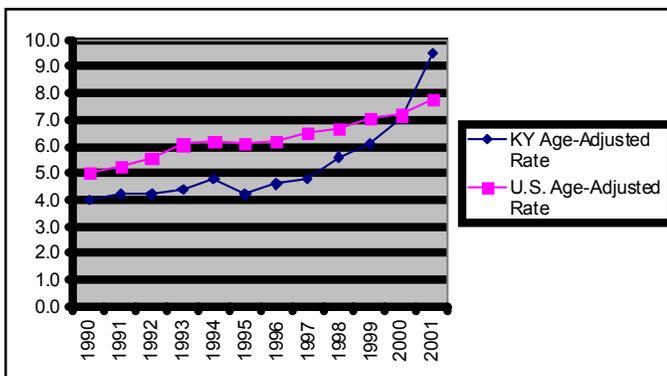
Table 2 displays the number of Kentuckians who died as a result of poisoning for the period 1990-2001, according to WISQARS, with the age-adjusted death rates for both Kentucky and the United States.

Table 2. Poisoning Deaths, Kentucky and United States, 1990-2001

Year	Number of KY Residents	KY Age-Adjusted Rate	U.S. Age-Adjusted Rate
1990	148	4.0	5.0
1991	153	4.2	5.3
1992	157	4.2	5.6
1993	168	4.4	6.1
1994	184	4.8	6.2
1995	164	4.2	6.1
1996	181	4.6	6.2
1997	190	4.8	6.5
1998	224	5.6	6.7
1999	245	6.1	7.1
2000	289	7.1	7.2
2001	393	9.5	7.8

Because these data are based on death certificates, which represent a census of deaths in any given year, tests of statistical significance and trend were deemed unnecessary. Figure 1 graphically represents the age-adjusted death rates.

Figure 1. Age-adjusted death rates



As evident from Figure 1, Kentucky has historically had a lower poisoning-related mortality rate than the nation. While the national rate of poisoning deaths rose gradually over this period, the Kentucky rate escalated sharply beginning in approximately 1997, and with sharp increases in 2000 and 2001 surpassed the national rate by a considerable

margin.

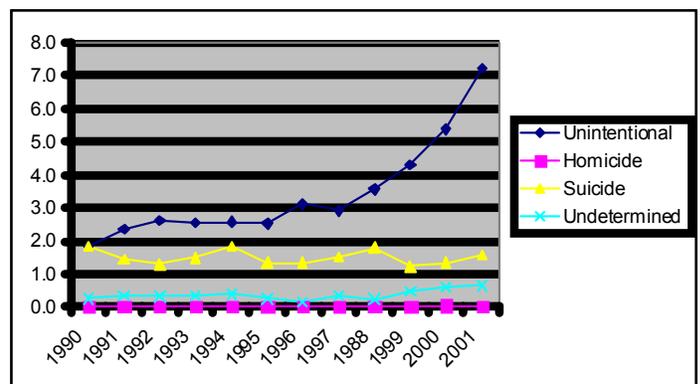
Poisoning deaths by intentionality, 1990-2001

We then queried WISQARS for poisoning deaths based on the intent to injure (Table 3) in order to determine whether the trend evident in our analysis is driven by one or more particular manners of death (unintentional, suicide, homicide, or undetermined intent). Figure 2 graphically displays these four intents during the same period. The trend is clearly driven primarily by unintentional poisonings.

Table 3. Age-Adjusted Rates of Poisoning Deaths by Intent to Injure (KY Residents, 1990-2001)

Year	Manner of Poisoning							
	Unintentional		Homicide		Suicide		Undetermined	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1990	71	1.8	1	0.0	66	1.8	10	0.3
1991	87	2.4	0	0.0	53	1.5	13	0.3
1992	95	2.6	0	0.0	49	1.3	13	0.3
1993	98	2.6	0	0.0	57	1.5	13	0.4
1994	99	2.6	0	0.0	70	1.8	15	0.4
1995	99	2.5	1	0.0	53	1.4	11	0.3
1996	122	3.1	0	0.0	53	1.3	6	0.2
1997	114	2.9	2	0.0	59	1.5	15	0.4
1998	142	3.6	0	0.0	72	1.8	10	0.3
1999	174	4.3	1	0.0	50	1.2	20	0.5
2000	219	5.4	2	0.0	55	1.4	13	0.6
2001	300	7.2	0	0.0	66	1.6	27	0.7

Figure 2. Poisoning Intent Rates



Substances mentioned in unintentional poisoning deaths

All diagnoses (entity-axis codes) were scanned on the multiple-cause-of-death files to identify the substances that were mentioned on the death certificates of Kentucky-resident unintentional poisoning victims from 1999-2001 (Table 4). (Poisonings of undetermined intent were included

(Continued on Page 3)

in this analysis because they showed an increasing trend as well, although their number was much smaller.) Agents of poisoning are defined by ICD-10 T-codes in the range T36-T65. Note: the figures in Table 4 represent the total number of times each substance was mentioned on any poisoning death record, *not* the number of deaths in which it was identified. For example, in the 753 total deaths there were 1,529 substances identified, of which 175 were classified as ‘other opioids,’ 90 as ‘methadone,’ etc. Similar results were first reported by Singleton et al (CDC 2004).

These codes are grouped into two major categories: drugs and medicinal agents (T36-T50) and non-medicinal agents (T51-T65). The former accounted for nearly nine out of every ten substances mentioned in deaths from 1999-2001. In the latter group, most of the mentions were of alcohol (6.4% of total) or carbon monoxide (3.1%).

Focusing on the ‘drugs and medicinal agents’ category, we find that ‘other opioids’ (T40.2) – a category which includes Oxycontin and similar pain-relieving prescription medications – was the most frequently mentioned of the 4-digit T-codes (11.4% of total), with the exception of the non-specific code T50.9 (39% of total), which represents ‘other and unspecified drugs, medicaments, and biological substances’. However there were several other types of medications that showed significant and increasing numbers of mentions from 1999-2001, foremost of which were benzodiazepines (T42.4, 6.1% of total), methadone (T40.3, 5.9% of total), and antidepressants (T43.0 and T43.2, 5.2% of total). Also, cocaine mentions (4.8% of total) jumped strongly in 2001 after remaining stable in 1999-2000.

One well-publicized and highly scrutinized occurrence during the period under discussion was the emergence of oxycodones. Oxycontin, in particular, was developed and patented in 1996 by Purdue Pharma, LP. The manufacturer began an aggressive marketing campaign, aimed largely at Appalachian counties in Eastern Kentucky and the surrounding areas. Shortly thereafter a number of ill effects began to be reported in the region. From 1997-2001 possession and trafficking charges for

all controlled substances in Eastern Kentucky rose 348 percent (Camp 2003). Admissions of prescription drug addicts tripled in the region from 1998-2001 (Camp 2003). From January 2000 through June 2001, of 1,000 Kentucky pharmacies, 69 were burglarized in an attempt to obtain Oxycontin (DEA website).

However, two points need to be clearly stressed. (1) Opioids – of which Oxycontin, Lorcet, Lortab, and Vicodin are a few examples – are not the only class of substance that we found to be driving this trend. Our findings suggest that opioids are only one of several pharmaceuticals, including antidepressants, benzodiazepines, methadone, and possibly others that we could not specifically identify, that have increasingly been mentioned in overdose deaths in recent years. Kentucky has been associated with high rates of abuse of the prescription medications Xanax and Soma (Gil 2002). Methamphetamine labs have seen a recent increase in the state of Kentucky, largely due to the increased profit margin associated with these products over marijuana. (2) Eastern Kentucky is not the only region affected by this problem. In fact, all Area Development Districts experienced the same trend, although the rates and the magnitude of the increases varied by region (Singleton 2003).

An analysis of the number of substances identified per fatality is possible using the multiple-cause-of-death files, but such an inquiry is beyond the scope of this article. An analysis of drug interactions using this data source would probably leave much to be desired because of the 40% of substances that were coded as “Unspecified.”

Summary

The unintentional poisoning death rate rose quite strongly from 1997 through 2001, and using the NCHS multiple-cause-of-death files we identified several substances that were increasingly mentioned in those deaths that occurred between 1999 and 2001. Overall, prescription drugs and other medicinal agents were much more commonly mentioned than illicit drugs such as cocaine and heroin. However, the T-codes for nearly 40% of the identified substances were non-specific, *(Continued on Page 4)*

leaving our picture still substantially incomplete. In addition to their lack of specificity, the following limitations of T-codes should be mentioned: (1) They do not specify whether prescription medications were used as prescribed, or even whether the decedent was the person for whom they were prescribed; (2) They do not identify a particular substance, or combination thereof, as the definitive cause of death, but simply indicate the presence of one or more substances at the time of death. For questions or comments, please contact Michael Singleton, (859) 257-5809 or msingle@email.uky.edu.

Table 4. Poisonings by Substance

Agent of Poisoning	Code	1999		2000		2001		Total	
		Number	Percent*	Number	Percent*	Number	Percent*	Number	Percent*
Total number of deaths	-	194		232		327		753	-
T36-T65 any mentioned	T36-T65	356	100.0	479	100.0	694	100.0	1,529	100.0
Poisoning by Drugs, Medicaments and Biological Substances	T36-T50	301	84.6	420	87.7	623	89.8	1,344	87.9
Nonopioid analgesics, antipyretics, antirheumatics	T39	10	2.8	14	2.9	13	1.9	37	2.4
Narcotics and psychodysleptics (hallucinogens)	T40	81	22.8	145	30.3	215	31.0	441	28.8
Heroin	T40.1	0	0.0	2	0.4	2	0.3	4	0.3
Other opioids	T40.2	37	10.4	52	10.9	86	12.4	175	11.4
Methadone	T40.3	9	2.5	30	6.3	51	7.3	90	5.9
Other synthetic narcotics	T40.4	7	2.0	5	1.0	14	2.0	26	1.7
Cocaine	T40.5	19	5.3	18	3.8	36	5.2	73	4.8
Other and unspecified narcotics	T40.6	8	2.2	37	7.7	25	3.6	70	4.6
Cannabis	T40.7	1	0.3	1	0.2	1	0.1	3	0.2
Anaesthetics and therapeutic gases	T41	1	0.3	0	0.0	0	0.0	1	0.1
Antiepileptic, sedative-hypnotic and antiparkinson drugs	T42	21	5.9	30	6.3	54	7.8	105	6.9
Barbiturates	T42.3	1	0.3	1	0.2	3	0.4	5	0.3
Benzodiazepines	T42.4	18	5.1	28	5.8	48	6.9	94	6.1
Antiparkinsonism drugs and other central muscle-tone depressants	T42.8	0	0.0	1	0.2	2	0.3	3	0.2
Psychotropic drugs, not elsewhere classified	T43	20	5.6	38	7.9	59	8.5	117	7.7
Tricyclic and tetracyclic antidepressants	T43.0	12	3.4	15	3.1	15	2.2	42	2.7
Other and unspecified antidepressants	T43.2	3	0.8	13	2.7	22	3.2	38	2.5
Phenothiazine antipsychotics and neuroleptics	T43.3	2	0.6	2	0.4	14	2.0	18	1.2
Other and unspecified antipsychotics and neuroleptics	T43.5	0	0.0	4	0.8	5	0.7	9	0.6
Psychostimulants with abuse potential	T43.6	3	0.8	4	0.8	3	0.4	10	0.7
Drugs primarily affecting the autonomic nervous system	T44	0	0.0	0	0.0	1	0.1	1	0.1
Primarily systemic and haematological agents, not elsewhere classified	T45	4	1.1	5	1.0	12	1.7	21	1.4
Agents primarily affecting the cardiovascular system	T46	3	0.8	5	1.0	5	0.7	13	0.9
Agents primarily affecting the gastrointestinal system	T47	0	0.0	0	0.0	0	0.0	0	0.0
Agents primarily acting on smooth and skeletal muscles and respiratory system	T48	1	0.3	2	0.4	2	0.3	5	0.3
Topical Agents primarily affecting skin/mucous memb & by ophth, otorhino & dental drugs	T49	0	0.0	0	0.0	0	0.0	0	0.0
Diuretics and other and unspecified drugs, medicaments, and biological substances	T50	160	44.9	181	37.8	262	37.8	603	39.4
Diagnostic agents	T50.8	1	0.3	1	0.2	0	0.0	2	0.1
Other and unspecified drugs, medicaments and biological substances	T50.9	157	44.1	180	37.6	260	37.5	597	39.0
Toxic effects of substances chiefly nonmedicinal as to source	T51-T65	55	15.4	59	12.3	71	10.2	185	12.1
Alcohol	T51	25	7.0	34	7.1	39	5.6	98	6.4
Organic solvents	T52	3	0.8	1	0.2	4	0.6	8	0.5
Other inorganic substances	T57	0	0.0	1	0.2	0	0.0	1	0.1
Carbon monoxide	T58	13	3.7	19	4.0	14	2.0	46	3.0
Other gases, fumes and vapours	T59	13	3.7	2	0.4	6	0.9	21	1.4
Pesticides	T60	0	0.0	1	0.2	2	0.3	3	0.2
Other and unspecified substances	T65	1	0.3	1	0.2	4	0.6	6	0.4

* Denominator for percentages is the total number of substances identified (T-codes T36-T65)

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(Continued on Page 5)

**Cases of Selected Reportable Diseases and Motor Vehicle Injury Deaths in Kentucky
YTD Through August for Each Year**

Disease	2004	2003	5-yr Median
AIDS	168	103	168
Chlamydia	3718	5498	5498
Gonorrhea	1623	2399	2371
Syphilis (Primary & Secondary)	27	29	30
Group A Streptococcus	50	37	29
Meningococcal Infections	8	12	12
<i>Haemophilus influenzae</i> , invasive	4	2	4
Hepatitis A	25	22	35
Hepatitis B	40	45	40
E.coli O157H7	19	17	21
Salmonella	227	261	227
Shigella	48	68	93
Tuberculosis	69	82	82
Animal Rabies	18	29	18
Motor Vehicle Injury Deaths	621	569	569

Disease	2004 YTD	Total in 2003
Diphtheria	0	0
Measles	0	0
Mumps	0	0
Pertussis	40	53
Polio	0	0
Rubella	0	0
<i>Streptococcus pneumoniae</i>	21	31
Tetanus	2	0

Disease	2004 YTD	Total in 2003
Rocky Mountain Spotted Fever	0	3
Lyme Disease	12	17
Ehrlichiosis	1	5
Tularemia	0	2
Arboviral Encephalitis	0	14
Malaria	4	11

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RETURN SERVICE REQUESTED

Immunization Data Reporting and Exchange or *What the HIPAA is Going On?*

Gary Bevill

A bill passed in the most recent session of the General Assembly (SB 184) and an administrative regulation promulgated by the Department for Public Health (902KAR 2:055) will ensure that health care providers and other public health entities can report and exchange immunization information. This new law and administrative regulation are consistent with the privacy requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Prior to enactment of HIPAA, vaccination records were routinely shared among physicians, local health departments, hospitals, medical clinics, and schools. Since the Privacy Rule of HIPAA has gone into effect, some immunization providers in Kentucky have become reluctant to share immunization records for fear of violating the law's privacy requirements. This has created difficulties for immunization providers trying to determine a child's immunization needs and for parents attempting to document their child's immunization status for schools.

SB 184 will help alleviate this problem by requiring health care providers "that administer immunizations or supervise an immunization" to report information about the immunization in accordance with administrative regulations promulgated by the Department for Public Health. In addition, 902 KAR 2:055 permits health care providers, pre-schools, public and private schools, and state and local health departments to exchange immunization information if the person requesting the data provides health related or educational services on behalf of the patient or has a public health interest. 902 KAR 2:055 also permits immunization information to be electronically exchanged among health care entities via an immunization registry.

Health care providers and public health entities will still be required to safeguard the privacy of identifiable protected health information (PHI). This includes immunization information and the unauthorized use or release of information to persons or agencies that do not provide health related or educational services on behalf of the patient or who do not have a public health interest in the patient or the information.

The full text of SB 184 and 902 KAR 2:055 may be found at www.lrc.state.ky.us, or you may obtain a copy from the Immunization Program, Kentucky Department for Public Health, 275 East Main Street, Frankfort, Ky., 40601.